

ANALYSIS OF THE VACCINATION STATUS OF STUDENTS AT A MEDICAL SCHOOL**ANÁLISE VACINAL DE ESTUDANTES EM UMA FACULDADE DE MEDICINA****ANÁLISIS DE VACUNACIÓN DE ESTUDIANTES DE UNA FACULTAD DE MEDICINA**

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How to cite this article: Modiano P, Herrero ALO, Silveira AF, Piai RC, Veríssimo VHM, Moreira MLFF, Fabbro N, Pileggi GS. Analysis of the vaccination status of students at a medical school. Rev Enferm Atenção Saúde [Internet]. 2023 [access:_____]; 12(2):e202377. DOI: <https://doi.org/10.18554/reas.v12i2.5681>

ABSTRACT

Objective: The study analyzes the vaccination status of medical students at a college in the interior of São Paulo, in addition to verifying their knowledge regarding immunization.

Method: An analysis was carried out on the vaccination records of 277 medical students and a self-administered questionnaire was made available. Data analysis was conducted in a descriptive statistical manner to interpret the results. **Results:** It was found that more than half of the students have outdated vaccination records and few know which vaccines are indicated to health professionals, although more than half of the students recognize the risk of contagion and transmission of diseases related to an incomplete vaccination schedule.

Conclusion: These results demonstrate the need for medical students to be aware of updating their vaccination cards and deepening their knowledge and mastery of the topic of vaccination.

Descriptors: Vaccine; Vaccination; Risk; Knowledge; Medical students.

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RESUMO

Objetivo: O estudo analisa a situação vacinal dos estudantes de medicina de uma faculdade do interior de São Paulo, além de verificar seu conhecimento em relação à imunização.

Método: Foi realizada a análise na carteira vacinal de 277 estudantes de medicina e disponibilizado um questionário autoaplicável. A análise dos dados foi conduzida de maneira estatística descritiva para interpretação dos resultados. **Resultados:** Verificou-se que mais da metade dos estudantes apresentam carteiras vacinais desatualizadas e poucos conhecem quais vacinas são indicadas aos profissionais de saúde embora mais da metade dos estudantes reconheça o risco de contágio e transmissão de doenças relacionadas ao esquema vacinal incompleto. **Conclusão:** Esses resultados demonstram a necessidade de conscientização dos acadêmicos de medicina quanto à atualização de seus cartões vacinais e do aprofundamento do conhecimento e domínio sobre o tema vacinação.

Descritores: Vacinas; Vacinação; Risco; Conhecimento; Estudantes de medicina.

RESUMEN

Objetivo: El estudio analiza el estado de vacunación de estudiantes de medicina de una facultad del interior de São Paulo, además de verificar sus conocimientos sobre vacunación.

Método: Se realizó un análisis de los registros de vacunación de 277 estudiantes de medicina y se dispuso de un cuestionario autoadministrado. El análisis de datos se realizó de manera estadística descriptiva para interpretar los resultados. **Resultados:** Se encontró que más de la mitad de los estudiantes tienen cartilla de vacunación desactualizada y pocos saben qué vacunas están indicadas a los profesionales de la salud, aunque más de la mitad de los estudiantes reconocen el riesgo de contagio y transmisión de enfermedades relacionadas con un esquema de vacunación incompleto. **Conclusión:** Estos resultados demuestran la necesidad de que los estudiantes de medicina estén atentos a la actualización de sus carnés de vacunación y profundicen en el conocimiento y dominio del tema de la vacunación.

Descritores: Vacuna; Vacunación; Riesgo; Conocimiento; Estudiantes de medicina.

INTRODUCTION

The vaccine is configured as the lowest cost and most effective method in the health area, with the main result being the reduction of morbidity and mortality due to infectious diseases.¹ Brazil offers a variety of vaccines free of charge through the Unified Health System, which must be applied according to the National Vaccination Calendar. The following vaccines are foreseen in the National Immunization Program (PNI/2022), for individuals in adulthood (20-59 years, with the exception of hepatitis B, for all ages):

hepatitis B, diphtheria and tetanus, triple viral (measles, mumps and rubella) and the yellow fever vaccine.²

However, health professionals are permanently exposed to infectious diseases, usually immunopreventable by vaccination, constituting a risk group, including doctors, nurses, oral health professionals, health students, laboratory technicians, among others. They all play an important role in disseminating information about the importance and effectiveness of vaccination to ensure individual and collective health. Students, even if still in training, can

contribute to primary prevention by sharing knowledge.

For health professionals, in addition to the vaccines usually recommended for adults, the Brazilian Society of Immunizations (SBIIm/2022-2023) recommends vaccination against hepatitis A, chickenpox, influenza and meningococcal disease B.³ Regulatory Standard No. 32 (NR-32), which addresses health worker safety, also determines the need for immunization of these professionals.⁴

However, exposure to risk situations is already present in academic life, as students have contact with patients and are inserted in scenarios of outpatient and hospital practice such as Basic Health Units (UBS) and Family Health Strategies Units (ESF). They are, therefore, equally exposed to infectious and contagious diseases. Therefore, the PNI (2022)⁵ recommends immunization against: chickenpox, triple viral (measles, mumps and rubella), hepatitis B (risk of sharps accidents), yellow fever (municipality located in risk areas for the disease), Tdap (acellular) and seasonal influenza (available annually for at-risk populations and the elderly) and meningococcal conjugate C.

The literature shows that these academics have exposure rates to potentially contaminated biological material similar to those of a hospital team.⁶ Thus, Higher Education Institutions (HEIs) play an

important role in encouraging Immunization Programs and prevention of vaccine-preventable diseases to reduce the risks of acquiring preventable diseases. In the United States, health professionals must be vaccinated against hepatitis B, influenza, tetanus-diphtheria, mumps-measles-rubella (MMR) and chickenpox⁷ and students are required to present proof of immunization against these diseases.⁸ Although in Brazil not there is specific legislation on the mandatory updated CV for admission to institutions with courses in Health, The HEI in this study recommends vaccines for health professionals and their students: anti-hepatitis B, anti-flu, anti-tetanus, diphtheria, whooping cough and anti-measles, mumps, rubella and chickenpox.

This research aimed to analyze the situation vaccination of medical students at the Faculty of Health Sciences of Barretos Dr. Paulo Prata (FACISB), inserted in the contexts of practice, verifying their knowledge about vaccination. Knowledge about: immunopreventable infectious and contagious diseases was evaluated; existence of a specific vaccination schedule for health professionals; vaccines recommended to health professionals; the approach to vaccination in graduation and its implication in vaccine adherence; the risks of exposure of the unvaccinated professional; the risks to the patient under the care of a health professional; adverse events from vaccines,

emerging vaccine-preventable diseases due to non-immunization, and hesitancy to vaccinate as a result of anti-vaccine movements.

The researchers started from the hypothesis that all enrolled students had an updated CV and were properly vaccinated, as recommended by SBIm/2022/2023 or PNI/2022/NR32 and recommended by the HEI.

The limited availability of data in the Brazilian literature on the knowledge of medical students in relation to immunization and their vaccination status, makes it necessary to carry out research projects in this area. Especially because knowledge about the subject and its credibility will guide the indication of immunobiologicals to patients.

MATERIAL AND METHODS

The project was approved by the Research Ethics Committee of the Hospital do Amor de Barretos (CEP/Fundação Pio XII), under protocol nº 3,469,195. All research participants signed the informed consent form (TCLE) and the norms of the Resolution of the National Health Council (CNS) nº 466, of December 12, 2012, for research involving human beings were obeyed.

This is an observational, descriptive, cross-sectional study with a quantitative approach, whose sample included medical

students from the FACISB, enrolled from the 2nd to the 6th year of the course, and who work in the health services of the municipalities of Barretos and Bebedouro (São Paulo).

The sample inclusion criteria were: being a student at the institution; work in the health sector designated by the institution and agree to participate in the research, signing the TCLE. The exclusion criteria were: erasing or not returning the applied questionnaire; the student's withdrawal from the institution.

The objectives of the study were previously presented to all students in the classroom, through oral exposition and with the support of members of the Study Group on Vaccination (GEV), composed of 10 medical students, in different periods of the course of graduation. Next, a date was established for the presentation of the TCLE and completion of the self-administered structured questionnaire, by the students who voluntarily adhered to the research. With the list of participants in hand, the researchers accessed the FACISB system to proceed with the CV analysis of each respondent. Participants with an outdated CV were instructed to update the vaccines and the document in the student area of the FACISB system.

The instruments used for data collection were: document analysis of the participants' VC and the application of a

questionnaire without prior testing and with multiple choices about knowledge about vaccination, vaccination schedule for health professionals, adverse events, emerging diseases related to non-vaccination, anti-vaccine movements and their impact on vaccine adherence, risks of contagion and transmission of vaccine-preventable disease agents. The application of the questionnaire took place in the classroom at FACISB by the student-researcher, with the support of 5 GEV students. For each item of the questionnaire, the alternatives “Yes”, “No” and “I don't know” were presented, and these answers were quantified later.

All data were described and calculations of percentage values quantified for descriptive statistical analysis and interpretation of results, with the aid of tables.

RESULTS

During the period of this study, FACISB had 535 students, of which 433 were regularly enrolled between the 2nd and 6th year of the course. Our sample had 277 students, 192 (69.3%) women and 85 (30.6%) men. As for the distribution by period, who presented the CV, there were 79 students (81.4%) of the 2nd year, 71 students (73.1%) of the 3rd year, 86 students (92.4%) of the 4th year and 41 students (26.9%) from the 5th and 6th years. The average age of the students was 21 years old

(SD= 2.3).

With regard to updating the CV, the list per class was: 17 (48.5%) from the 2nd year, 22 (40%) from the 3rd year, 48 (60%) from the 4th year and 6 (17.6%) from the 5th and 6th years present the updated CV (Table I).

Of the 277 students whose CVs were analyzed, 204 answered the questionnaire. When asked if they were aware of the existence of a specific calendar for health professionals, 92 (45%) students answered in the affirmative, while 112 (54.9%) said they were unaware of the information.

Regarding the vaccines indicated for specific areas of activity, 63 (31.5%) answered that they knew, while 137 (68.5%) answered that they had no knowledge and 4 (1.9%) did not answer the question. As for vaccines, of the 36 (17.6%) students who said they knew which vaccines were indicated for health professionals, 28 (77.7%) believed that the Influenza vaccine should be included in the professionals' CV, while 11 (30.55%) indicated the hepatitis B vaccine, 7 (19.4%) indicated the MMR vaccine and 6 (16.6%) the adult vaccine.

Related to the importance of vaccination for health workers, it was observed that, of the 79 participants in the 2nd, 3rd, 4th, 5th and 6th years, 158 (78.6%) recognized its relevance and believed in the importance of vaccination for actors in health. As for the higher risk of infection by

vaccine-preventable diseases when talking about students and health professionals, 195 (95.5%) of the participants agree with this statement.

Concerning knowledge about the dimension of risks for health professionals, when they come into contact with patients with certain diseases without being vaccinated, 195 (94.1%) students reported a high risk, 4 students (1.9%) reported a low risk and 5 (2.4%) answered that there is no risk.

With regard to knowledge about the risks presented to the patient who is under the care of a health professional who can be a possible vehicle for the spread of diseases, 191 (94%) answered that the risk exists and is high, 11 (5.4%) of the students answered that the risk exists, but it is low and 2 (0.9%) of the students answered that there is no risk.

On the subject of “vaccination”, 155 (77.5%) of the students consider that the subject is rarely addressed and 50 (25%) believe that it is addressed or clarified

during graduation. About vaccination being poorly addressed or unclear, 144 (72%) see this as a barrier to adherence to vaccination, while 60 (30%) do not see this as an obstacle.

When asked about adverse events caused by vaccines, 100 (49%) reported having knowledge, but 104 (50.9%) did not know, as shown in Table II. Regarding the sources consulted for information, 33.3% of students use Ministry of Health materials as a reference.

Regarding the diseases that are emerging again as a result of low vaccination coverage, 181 (88.7%) reported having this information, while 23 (11.2%) reported not knowing what the diseases are and 136 (66.6%) reported the measles as a reemerging disease.

With regard to anti-vaccine movements, 195 (95.5%) of the students believe that some of the diseases that have not yet been eliminated in the country and in the world are due to these movements, as shown in Table I.

Table I– Knowledge about vaccines

knowledge questionnaire	Knowledge	Unfamiliarity	No answer
Existence of a specific calendar for health professionals	92 (45.1%)	112 (54.95%)	-----
Vaccines indicated for specific areas of activity	63 (31.5%)	137 (68.5%)	4 (1.9%)
Vaccines indicated to health professionals			
Influenza	28 (77.7%)		
Hepatitis B	11 (30.5%)		
triple viral	7 (19.4%)		
adult duo	6 (16.6%)		
Importance of vaccination	158 (78.6%)		
Greater risk of infection by vaccine-preventable diseases when talking about students and health professionals	195 (95.5%)		
Dimension of the high risk for the health professional, when coming into contact with patients with certain diseases, without being vaccinated	195 (94.1%)		
High risk presented to the patient who is under the care of a healthcare professional who may be a possible vehicle for the spread of disease	191 (94%)		
Immunization topic little addressed in graduation	155 (77.5%)		
The superficial approach can become a barrier to vaccine adherence	144 (72%)		
Adverse events from vaccines	100 (49%)	104 (50.9%)	
Ministry of Health as a reference source on the subject	33%		
Diseases that are emerging again due to low vaccine coverage	181 (88.7%)	23 (11.2%)	
Anti-vaccine movements delaying the elimination of some diseases	195 (95.5%)		

Source: authors, 2021

Regarding the VCs analyzed, the results show that all vaccines indicated for health professionals are not up to date or with their complete schemes. The vaccine that was closest in percentage to the ideal vaccine coverage among the participants was Hepatitis B, with 144 (63.7%) of the students having a complete vaccination schedule. The coverage of the adult pair with their reinforcements was 115 (50.8%)

among the students. As for the MMR, 119 (52.6%) of the students had the 2 doses of SCR indicated for professional practice. The yellow fever vaccine was covered by 116 (51.3%) students, with at least 1 dose. Regarding the varicella vaccine, 51 (22.5%) had at least 1 dose in the VC. As for the Tdap vaccine, 11 (4.8%) of the students had a dose recorded on their VC.

Table II– Vaccination coverage of medical students at FACISB

Vaccine	T5 and T6		T7		T8		T9	
	n	%	n	%	n	%	n	%
Hepatitis B	20	83.3	73	96	53	73.6	41	93.1
SCR	20	83.3	58	76.3	42	58.3	41	93.1
dT	10	41.6	47	61.8	38	52.7	35	79.5
dTpa	3	12.5	7	9.2	7	9.7	0	0
Varicella	19	79.1	51	67.1	30	41.6	24	54.5
Yellow fever	18	75	51	67.1	45	63.8	17	36.3
TOTAL	24A		76A		72A		45A	

Source: authors, 2021

^A legible CVs

** 60 CV were illegible for analysis

T - Student class

DISCUSSION

Active immunization, considered as the protection of the immune system, is an essential part of infection control programs in occupational health of the population. It reduces the risk of disease transmission to patients and the healthcare worker's risk of acquiring vaccine-preventable diseases.

Although the obligation to present proof of updated vaccination status for enrollment in universities has been revoked, the CV is an interesting tool to ensure adequate immunization and protection against the occupational risk to which students may be exposed.⁹ In study at UFJF⁹, it was reported that most students entering in 2003 and 2004, with Ordinance MS/GM No. 597, did not present proof of vaccination upon enrollment. The authors demonstrated a similar situation, noting that only 55% of American HEIs request proof of vaccination upon registration.¹⁰ In their study, Mancuzo et al¹¹ also showed that there was low vaccination coverage among

students enrolled from the fifth to the tenth period. of the Medicine course.

The low response to the initial proposal to survey the vaccination status of students contradicted the hypothesis considered in the design of this research (that all students would have their CVs updated in the FACISB system, adhering en masse to the invitation to participate in the research). This fact reinforces the need for standardization and expansion of support and guidance under the responsibility of the HEI. In the characterization of the sample, we verified that, even though students supposedly have greater access to information and training in immunization, this does not guarantee their commitment to the conservation and preservation of the VC, as well as its availability upon request.

Regarding the importance of vaccination for health professionals, most students recognize it as a form of protection against infectious risks¹², but are unaware of the recommended vaccines and the existence

of a specific vaccination schedule for health professionals. As a result of their work, health professionals are exposed to infectious agents that can put them at risk of developing (either themselves or their contacts, whether patients or family members) infectious diseases. Their vaccination, however, has been described as suboptimal in several places, discussing the need for compulsory vaccination for this group. Immunization is an essential part of infection control programs in occupational health, as it ensures that workers in the area reduce the risk of acquiring and transmitting vaccine-preventable diseases, as well as a reduction in the number of vulnerable individuals and professionals. Regarding specific vaccines, some students answered that the recommended vaccination for health professionals is influenza. In other studies¹², even considering the reliable PNI, 17% of students do not recognize that vaccines protect against potentially fatal diseases, and 64.5% of students and 38.5% of doctors are unaware of the vaccines that are part of our official schedule. Not knowing the potential severity of vaccine-preventable diseases or knowing which ones are available at no cost to the population may indicate lack of concern about the imminent risk of these diseases and the individual and collective importance of vaccines among health professionals. Adequate knowledge of health professionals (and medical students)

about the effectiveness of vaccines may reflect on the increase in vaccination coverage. Other researchers¹³ have already demonstrated that knowledge about the recommendations of the Society of Infectology was very low (9.9%).

During graduation, graduates should understand the theoretical and practical aspects of the prevention and control of infections related to medical care, constituting elements for a coherent professional performance. The teaching of this theme must be, above all, an ethical commitment of both HEIs and educators, especially those involved in practical activities.

The students believe that the subject of vaccination is rarely addressed and see this limitation as a barrier to adherence to vaccination. Our results were similar to those of three other studies^{9,14}, showing a compartmentalized orientation and a fragmented approach, which makes it difficult to aggregate knowledge in a consistent and applicable way to the daily life of the health professional. Some authors¹⁵ claim that, despite the curricular subject being the greatest source of information, there is a dilution of this content in a series of subjects, such as those of the common basic cycle such as Biochemistry, Immunology and Microbiology, and those specific to each course. There is no consensus on a specific

discipline, with approximately 32 different disciplines cited. HEIs should systematically and more effectively prepare students for health promotion and disease prevention measures, in addition to promoting policies for the implementation of systematic immunization programs for their students.¹⁶ Student contact with all institutions should be made possible. norms and legislation pertinent to the regulation of infection prevention and control. The earlier the contact, the greater the chance for the future professional to become aware of and assimilate the recommended practices.

Less than half of the students reported knowing the adverse events of vaccines. Studies carried out in France with medical students¹⁷ and in Korea with family medicine residents¹³ to assess knowledge about vaccines revealed ignorance of the subject and unpreparedness for medical practice, particularly in the discussion of adverse events, vaccination of health professionals and strategies to face the disease. vaccine refusal. In both studies, the authors suggest that teaching about vaccines is insufficient, and it is essential to invest in the area.

A large percentage of the students interviewed reported knowing the risk of health professionals being a vehicle for the spread of diseases when not vaccinated and they recognize that the risk of transmission is high. The final objective of administering

an immunobiological is not just the protection of an individual against a certain disease, aiming at individual immunity. In fact, vaccination carried out by the network of public health services seeks, mainly, to produce collective immunity, which will allow the eradication or reduction and control of various diseases.

In our research, a low percentage of students presented a complete VC for Hepatitis B, SCR, dT and yellow fever. It is highlighted, based on the literature, that vaccination is still an important problem to be faced among professionals responsible for the immunization of populations, having relevant potential in immunization or vulnerability. The data draw attention to the consequences related to inadequate vaccination coverage that impact not only on individual immunity, but also directly or indirectly influence the increase in the incidence of infectious diseases, recurrence of already eradicated diseases, epidemics, higher incidence of disease complications, decrease of herd immunity, greater economic impact related to treatments and increased mortality from preventable diseases.

In view of this context, it is extremely important to achieve higher rates of vaccination coverage in the studied population, through campaigns and the implementation of educational actions about adequate immunization, encouraging

everyone in the health area, due to the high risk of exposure to infections.

Most participants in this study reported that anti-vaccine movements would be harming vaccine coverage. This corroborates the assertions of other researchers¹⁸, who warned that social media promote information that is not always reliable about the safety of vaccines, their effectiveness, risks; based on information without scientific evidence. In social media there is an avalanche of information based on religious, philosophical and political foundations, which can jeopardize the success of vaccines. Therefore, safe and competent professionals are needed to clarify the matter, minimizing the risk of resistance to vaccination.

LIMITATIONS

In this study, vaccination coverage against chickenpox was not included for academics who did not have the disease in childhood, and also meningococcal C, available only in the private network for the age of the research population. The illegibility of many vaccination cards and the unavailability of access to another document proving vaccination may also have limited the study.

CONCLUSION

Believing that vaccination of health professionals is already recognized as a

protection against the risk of infections, immunization needs to be evaluated, as well as the causes that determine vaccine hesitancy. Identifying misinterpretations of concepts and conceptions in students and future professionals is essential to introduce effective programming for teaching immunizations and infectious disease prevention into curricular matrices. Sensitizing future doctors through discussions about the importance of vaccination and discouraging their hesitation can be decisive measures for the success of vaccination programs.

Undergraduate vaccination studies contribute to strengthening the theme in the teaching, research and extension program, as they highlight the skills that must be developed during academic life, strengthened and deepened on a daily basis to ensure safe and quality health care.

As an initial hypothesis, it was believed that the students in the sample would have mastery over the issue of vaccination, keeping their CVs always updated in the college system, but the results showed the opposite, warning that HEIs implement awareness programs with the student body, with the direct support of the faculty, encouraging the academic community to fully adhere to SBIM, PNI and NR32.

Although this was an intramural study, it is possible to extrapolate the results to the

reality of other HEIs. It is understood that, without proper monitoring and ongoing guidance, students may complete the medical course with their respective incomplete vaccination schedules, without mastering the essential information for clinical practice, compromising their medical practice. Thus, it is up to the HEI to implement a continuous approach to the subject in medical training and regulate the delivery of the CV upon registration, with half-yearly checks and guidance in the face of delays and refusals. Above all, greater commitment from academics with regard to their immunization is needed.

Financing source:The authors declare that they have not received funding to carry out the research.

Conflict of interests:The authors declare no conflict of interest.

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RECEIVED: 07/07/21
 APPROVED: 05/24/23
 PUBLISHED: 07/2023